

May 27, 2005

Mr. Dennis Koehl  
Site Vice President  
Point Beach Nuclear Plant  
Nuclear Management Company, LLC  
6610 Nuclear Road  
Two Rivers, WI 54241-9516

SUBJECT: POINT BEACH NUCLEAR POWER PLANT, UNIT 2 - REQUEST FOR  
ADDITIONAL INFORMATION REGARDING PROPOSED LICENSE  
AMENDMENT FOR REACTOR VESSEL HEAD HANDLING (TAC NO. MC6729)

Dear Mr. Koehl:

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed your license amendment request dated April 29, 2005 (ML051300534), as supplemented by letters dated May 13 (ML051450531) and May 19, 2005. The proposed amendment would incorporate an analysis of a reactor vessel head handling event into the Final Safety Analysis Report. Your letter dated May 13, 2005, superceded the April 29, 2005, submittal and modified the proposed amendment to apply only to Unit 2. The NRC staff has identified areas where additional information is needed to complete its review of the amendment request.

Enclosure 1 provides the NRC staff's request for additional information related to the May 13, 2005, supplement. On May 17, 2005, these questions were informally provided to your staff for review to ensure that the intent of the questions was clearly understood and/or to identify any instances where the requested information had already been provided to the NRC staff on the docket. Your letter dated May 19, 2005, responded to these questions.

Enclosure 2 provides the NRC staff's request for additional information related to the May 19, 2005, supplement. On May 27, 2005, these questions were discussed with Mr. Capristo of your staff, and a mutually agreeable response date of June 6, 2005, was established. If you have any questions, please contact me at (301) 415-4018.

Sincerely,

**/RA/**

Harold K. Chernoff, Project Manager, Section 1  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-301

Enclosure: As stated

cc w/encl: See next page

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Point Beach Nuclear Plant, Unit 2  
Reactor Vessel Head Handling Event  
Request for Additional Information  
Docket No. 50-301

The following additional information related to your May 13, 2005, letter is being requested by U.S. Nuclear Regulatory Commission (NRC) staff:

The staff has concluded that the assessment provided in Enclosure 3 to your May 13, 2005, letter does not provide a sufficient technical basis or degree of rigor upon which to make a regulatory decision. The NRC staff believes that the 1982 analysis referred to in the Wisconsin Electric Power Company letter dated November 22, 1982, establishes an acceptable bounding scenario for evaluation of this event for replacement of the Point Beach, Unit 2 reactor vessel head during the spring 2005 refueling outage.

1. The frequency of very heavy load drops of  $5.6E-05$  described in NUREG-1774 represents an estimate based on recent operating experience with loads over 30 tons. Although recent causes of load drops have predominantly involved sling failure, other causes should not be discounted, as evidenced by Appendix A to NUREG-1774 and Section 4 of NUREG-0612. Of particular applicability to industry-standard handling systems is the potential for the wire rope supporting the load block to be cut or overloaded. This is a special concern with low head room lifts where the load block is deliberately raised near the upper block in order for the load to clear obstructions. From this position, a stuck relay or common operator error combined with failure of the upper limit switch could cause a load drop before corrective measures, such as removing power to the crane, could be implemented. At least one nuclear industry crane failure involved a so-called "two-blocking" where, in that case, the unloaded load block fell when the wire rope was cut.

Our understanding is that the new integrated head replacement may involve a low head room lift. Provide NRC staff with the measures that will be taken to specifically minimize the potential for "two-blocking" as defined in NUREG-0612. This should include, testing of controls and limit switches, operational restrictions when the load is near its maximum lift height.

2. Provide NRC staff with calculations that establish the total decay heat load and the 12.5 gpm makeup requirement discussed in your May 13, 2005, letter.
3. Provide NRC staff with the temporary modification package (TM 2005-008), including design details, associated with the makeup water supply method discussed in your May 13, 2005, letter. In addition, provide NRC staff with the procedures that will be used to operate this equipment including identification of time critical operator actions and documentation of procedure verification and validation.

4. Provide NRC staff with the calculation that establishes the flow rates and operational pressures that provide the basis for the conclusion, in your May 13, 2005, letter that the temporary modification will meet the flow requirements necessary to offset boiling and provide adequate core coverage with either hose connection. This should include discussion of the effect of any orifices or other flow limiting devices or restrictions.
5. Provide an analysis and/or technical evaluation that provide support for the conclusion in your May 13, 2005, letter that the bottom-mounted instrument tubes remain intact. This should include analysis or evaluation of the effect of the vessel displacement, related dynamic effects, the effect on welds, and the effect of any restraints or spacers.
6. The NRC staff has not previously approved WCAP-9198, "Reactor Vessel Head Drop Analysis." Revision 1 to WCAP-9198 states that, "The potential for fuel assembly damage from applicable buckling loads should be evaluated by the fuel supplier." Westinghouse Nuclear Service Advisory Letter 04-06, "Reactor Vessel Head Drop Analysis," states that for 14X14 fuel, damage to the fuel assembly structure could occur. However, it further states that cladding integrity is maintained. Your May 13, 2005 submittal lacks sufficient technical analysis and information to assess this statement as it relates to Point Beach, Unit 2. In addition, this assessment does not address any loadings resulting from the 1982 scenario. Therefore, NRC staff requests that dose calculations for this event be performed using a clearly bounding credible source term assumption, such as 100 percent clad gap release for all previously burned assemblies, and the initial conditions described in Enclosure 2 to your May 13, 2005, letter.
7. Submit a revised No Significant Hazards Consideration Determination that appropriately reflects the information provided in response to the introductory paragraph and Questions 1-6.

Point Beach Nuclear Plant, Unit 2  
Reactor Vessel Head Handling Event  
Request for Additional Information

Docket No. 50-301

The following additional information related to your May 19, 2005, letter is being requested by U.S. Nuclear Regulatory Commission (NRC) staff:

1. Provide an evaluation establishing that splashing of water injected through the proposed temporary connections to the upper head will not result in loss of water. Stated differently, all water entering via the upper head must be shown to flow into the downcomer or the upper plenum below the elevation of the reactor vessel flange.
2. Show that there is a lip of sufficient height on the top plate structure to trap injected water and reasonably ensure the water will flow into the downcomer or into the upper plenum below the elevation of the reactor vessel flange. If such a lip does not exist, then establish that a configuration exists that reasonably ensures water will flow into the downcomer or into the upper plenum below the elevation of the reactor vessel flange. A cut-away view of the hardware is necessary that clearly shows the configuration and the passages where water will flow downward.
3. Address the result of a slightly asymmetric head drop (i.e., the head comes to rest in a position other than fully aligned with the vessel), assess potential top plate deformation that results, if any, and establish that all water injected through the proposed temporary connections reaches the downcomer or the upper plenum below the elevation of the reactor vessel flange should a slightly asymmetric head drop occur (Reference Items 1 and 2, above).
4. Provide a detailed assessment of water behavior in the reactor vessel and timing during heatup and boiling including the effect of level swell as a result of thermal expansion during heatup and void development during boiling.
5. Provide an evaluation of the effect of the potential head drop on the head assembly upgrade package specifically addressing the ability of the proposed temporary modification to properly function after the head drop.
6. Provide a docketed copy of the bottom mounted instrument tube analysis previously provided informally to the NRC staff.
7. Provide the technical justification for assuming free movement of the bottom mounted instrument tubes given the very limited clearance between the tubes and the containment floor.
8. Provide the technical justification for ignoring the likelihood of bottom mounted instrument tube restraint due to friction, recognizing the potential for such restraint to result in tube crimping and possible cracking.

Enclosure 2

9. Provide the technical justification for ignoring the likelihood of high stresses in the bottom mounted instrument tubes resulting in weld cracking and subsequent leakage at the tube to reactor vessel junction.
10. The analysis of the bounding radiological consequences of a head drop includes the postulated radiological release from emergency core cooling system (ECCS). The doses due to the head drop are scaled to and compared to the current licensing basis analysis of the large-break loss-of-coolant accident (LOCA), as taken from Section 14.3.5 of the Point Beach Final Safety Analysis Report (FSAR). Table 14.3.5-5 gives different ECCS leakage rates for calculation of offsite doses (800 cc/min) vice the calculation of control room doses (400 cc/min). In a conference call on May 24, 2005, Point Beach staff clarified that 400 cc/min is the ECCS leakage administrative limit.

Although there is no specific guidance on the dose analysis of a head drop, some guidance on the ECCS leakage pathway in LOCA analyses can be considered useful. Section 4.2 in Appendix A to Regulatory Guide 1.195, "Methods and Assumptions for Evaluating Radiological Consequences of Design Basis Accidents at Light-Water Nuclear Power Reactors (ML031490640)," provides guidance on the assumption for ECCS system leakage, and states that the ECCS systems leakage factor of two multiplier is used to account for increased leakage in the systems over the duration of the accident and between surveillances or leakage checks. Provide a technical basis for why this multiplier has not been used as an assumption for the calculation of both the offsite and control room doses due to the head drop.

11. The NRC staff must make a finding as to whether the licensee has shown through control room dose analyses that General Design Criteria (GDC)-19 has been met for the proposed license amendment. The doses due to the head drop are scaled to and compared to the current licensing basis analysis of the large-break LOCA, as taken from Section 14.3.5 of the Point Beach FSAR. The FSAR LOCA dose analysis does not take into account the results of control room envelope unfiltered inleakage testing, nor does the scaling calculation. In response to the information requests in GL 2003-01, by letter dated September 29, 2004, the licensee committed to supply the final control room envelope testing inleakage results to the NRC as required to support any licensing actions. Provide a technical basis for not using the control room envelope unfiltered inleakage testing results in the analysis of the offsite and control room doses due to the head drop.

Point Beach Nuclear Plant, Units 1 and 2

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